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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/593,118	06/13/2000	James Howard Drew	99-836	5555

32127 7590 06/02/2006

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EXAMINER	
ROBINSON BOYCE, AKIBA K	

ART UNIT	PAPER NUMBER
3639	

DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/593,118	DREW ET AL.	
	Examiner	Art Unit	
	Akiba K. Robinson-Boyce	3639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☒ Claim(s) *5,7,9,11,14,15,20,22,24,26,29,30,35,37,39,41,44,45,50,52,54,56,59 and 60* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims rejected are 1-4,6,8,10,12,13,16-19,21,23,25,27,28,31-34,36,38,40,42,43,46-49,51,53,55,57,58 and 61-71.

DETAILED ACTION

Status of Claims

1. Due to correspondence filed 5/5/06, the following is a non-final office action. Prosecution for this case has been re-opened. Claims 1-71 are pending in this application and have been examined on the merits, and are rejected/objected as follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4,16, 17, 19, 31, 32, 34, 46, 47, 49, 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flockhart et al (US 6,064,731), and further in view of Horowitz et al (US 6,349,290).

As per claims 1, 16, 31, 46, Flockhart et al discloses:

Generating, by a processing system, a hazard function model based on attributes relating to a plurality of current customer accounts, /a calculating module/means for calculating, (col. 3, lines 5-11, "at risk" customer function invoked by account number, where the "at risk" customer function represents the hazard function model and the customer account number represents the attribute);

Generating, by the processing system, a hazard function for an existing customer, to determine probability of churn based on the hazard function model and

account data associated with customer and corresponding to the attributes/a generating module/means for generating, (Col. 3, lines 32-38, comparing the customer account number to the "at risk" database to determine if the customer is an "at risk" customer, also col. 1, lines 12-32 shows that the determination of an "at risk" customer is for existing customers);

determining a focus for retention-based interactions with the customer based on at least one of the hazard function and gain in lifetime value/means for determining, (col. 3, lines 38-52, shows that if there is an "at risk" customer, special treatment is implemented, also, col. 1, lines 24-28 shows that business generally implements customer service focus on agent training in an attempt to maintain high standards of service).

Flockhart et al does not specifically disclose calculating a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort, but does disclose the identification of "at risk" customers in col. 3,lines 32-38.

However, Horowitz et al discloses calculating a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort /a calculating module/means for calculating, (Col. 22, lines 6-18, shows the calculation of a "life stage" factor through comparison of the risk level of the advice to the risk tolerances to the previous customers' activity). Horowitz et al discloses this limitation in an analogous art for the purpose of showing that the risk factor information for the customer's "life stage" could be updated in the customer profile, thereby maintaining a record of the customer's risk to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort with the motivation of determining `the customers likelihood of switching during the time the customer is committed to the business.

As per claims 2, 17, 32, 47, Flockhart et al does not specifically disclose calculating a lifetime value /calculates a lifetime value, but does disclose the identification of "at risk" customers in col. 3, lines 32-38.

However, Horowitz et al discloses:

Calculating a lifetime value based on original contract terms and revenue associated with the customer/calculates a lifetime value, Flockhart et al does not specifically disclose calculating a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort, but does disclose the identification of "at risk" customers in col. 3,lines 32-38.

However, Horowitz et al discloses:

Calculating a lifetime value based on original contract terms and revenue associated with the customer/calculates a lifetime value, (Col. 22, lines 6-18, shows the calculation of a "life stage" factor through comparison of the risk level of the advice to the risk tolerances to the previous customers' activity, w/ col. 9, lines 8-14, shows the implementation of transactional sessions that only needs a single session to provide fulfillment of the original intent). Horowitz et al discloses this limitation in an analogous art for the purpose of showing that the risk factor information for the customer's "life

stage" could be updated in the customer profile, thereby maintaining a record of the customer's risk to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate a lifetime value based on original contract terms and revenue associated with the customer with the motivation of determining `the customers likelihood of switching during the time the customer is committed to the business.

As per claims 4, 19, 34 and 49, Flockhart et al discloses:

Specifying a set of incentives to offer the customer based on the gain in lifetime value, (Col. 3, lines 40-48, "at risk" customers given high priority).

As per claim 63, Flockhart et al discloses:

Generating, by a processing system and for each of a plurality of customers, a hazard function to determine a probability of churn for each customer, the hazard function based on attributes relating to customer account information, (Col. 3, lines 32-38, comparing the customer account number to the "at risk" database to determine if the customer is an "at risk" customer, also col. 1, lines 12-32 shows that the determination of an "at risk" customer is for existing customers);

Identifying a temporal-based retention effort based on the hazard function for each of the plurality of customers, (col. 3, lines 38-52, shows that if there is an "at risk" customer, some kind of special treatment is implemented, also, col. 1, lines 24-28 shows that business generally implements customer service focus on agent training in an attempt to maintain high standards of service);

Determining a focus for customer interaction based on the expected gain in value, (col. 3, line 63-Col. 4, line 5, shows that if a threshold is exceeded, the call is routed to a supervisor)

Flockhart et al fails to disclose calculating, for each of the plurality of customers, an expected gain in value from the identified retention effort, but does disclose the identification of "at risk" customers in col. 3,lines 32-38.

However, Horowitz et al discloses calculating, for each of the plurality of customers, an expected gain in value from the identified retention effort, (Col. 22, lines 6-18, shows the calculation of a "life stage" factor through comparison of the risk level of the advice to the risk tolerances to the previous customers' activity, where the advice given represents the retention effort). Horowitz et al discloses this limitation in an analogous art for the purpose of showing that the risk factor information for the customer's "life stage" could be updated in the customer profile, thereby maintaining a record of the customer's risk to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate, for each of the plurality of customers, an expected gain in value from the identified retention effort with the motivation of determining `the customers likelihood of switching during the time the customer is committed to the business.

As per claim 64, Flockhart et al discloses:

Generating a hazard function, based on a reference hazard function model, for each of the plurality of customers, (Col. 3, lines 32-38, comparing the customer account

number to the "at risk" database to determine if the customer is an "at risk" customer, where the reference is coming from the values in the database);

As per claim 65, Flockhart et al discloses:

Wherein the temporal-based retention effort comprises retention actions directed to each customer during a second time period occurring after the first time period, (col. 3, line 53-col. 4, line 5, first routing the call to a specialist, then to a supervisor).

4. Claims 3, 6, 8, 10, 12, 13, 18, 21, 23, 25, 27, 28, 33, 36, 38, 40, 42, 43, 48, 51, 53, 55, 57, 58, 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flockhart et al (US 6,064,731), and further in view of Horowitz et al (US 6,349,290), and further in view of Bank Marketing International "Are your customers profitable?".

As per claims 3, 18, 33 and 48, Flockhart et al discloses:

Analyzing...the hazard function generated for the customer; and specifying a set of marketing techniques based on...the hazard function, (Col. 3, lines 32-38, comparing the customer account number to the "at risk" database to determine if the customer is an "at risk" customer, also col. 1, lines 12-32 shows that the determination of an "at risk" customer is for existing customers, w/col. 3, lines 38-52, shows that if there is an "at risk" customer, special treatment is implemented, also, col. 1, lines 24-28 shows that business generally implements customer service focus on agent training in an attempt to maintain high standards of service).

Flockhart et al, nor Horowitz et al disclose analyzing the shape of the hazard function generated for the customer, but Flockhart does disclose an "at risk" customer function in col. 3, lines 5-11.

However, Bank Marketing shows that altered models are used to determine the likelihood of a customer switching on Page 4, paragraph 8, lines 1-5. Therefore, the analysis of the shape of the hazard function is obvious with Bank Marketing this section shows that factors such as propensity to defect and altered cost models associated with the business are evaluated, and a rank order is assigned to customer base based on the lifetime value.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to analyze the hazard function generated for the customer, and specify a set of marketing techniques based on the hazard function with the motivation of implementing a marketing technique that suits the customer's situation.

As per claims 6, 21, 36, 51, neither Flockhart et al, Horowitz, nor Bank Marketing disclose taking no further steps to deter churn, but Flockhart et al does disclose taking the steps to deter churn for a particular call in Col. 3, lines 53-63, and discloses that a customer abandons a call in col. 4, lines 50-52. Therefore, taking no further steps to deter churn is obvious with Flockhart et al since after the customer abandons the call, there would be no reason to deter churn since the customer is no longer in the system and churn in this case, is directed towards customers who are making calls.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to take no further steps to deter churn with the motivation of ending the churn process when the customer is no longer part of the customer-base.

As per claims 8, 10, 12, 23, 25, 27, 38, 40, 42, 53, 55, 57, Flockhart et al fails to disclose having a moderate pre-expiration effort where new contracts or continued

contracts are the goal/ concentrating effort on pre-expiration of contract where a contract renewal may not be required/having high intensity pre-expiration effort with continued competitive offers to maintain customer, but Flockhart et al does disclose determining the possibility of churn by determining "at risk" customers in col. 3, lines 5-8.

However Horowitz discloses:

Having a moderate pre-expiration effort where new contracts or continued contracts are the goal/concentrating effort on pre-expiration of contract where a contract renewal may not be required/having high intensity pre-expiration effort with continued competitive offers to maintain customer, (Col. 20, lines 50-55, includes evaluating the performance of contracts). Horowitz discloses this limitation in analogous art for the purpose of showing that evaluating the performance of contracts can be implemented into the analysis of advice given to a customer.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to produce new or continued contracts with the motivation of keeping dedicated customers.

As per claims 13, 28, 43 and 58, neither Flockhart et al nor Horowitz disclose determining that value of the set of incentives offered to the customer does not exceed the gain in lifetime value, but Flockhart et al does disclose that a call is routed to a supervisor for special handling if a threshold is exceeded in Col. 4, lines 1-5.

However, Bank Marketing discloses:

Determining that value of the set of incentives offered to the customer does not exceed the gain in lifetime value, (page 5, paragraph 11, lines 5-8, represented by offering a lower price, or dropping a charge by knowing the lifetime value and still making a good return). Bank Marketing discloses this limitation in an analogous art for the purpose of showing that incentives such as offering a lower price can be included without affecting the customer's loyalty to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to determine that value of the set of incentives offered to the customer does not exceed the gain in lifetime value with the motivation of matching the value of incentives with the lifetime value.

As per claims 66-69, Flockhart fails to disclose wherein calculating a gain in lifetime value based on a change in the hazard function resulting from a retention effort, but does disclose a retention effort by identifying "at risk" customers and then implementing special treatment as disclosed in col. 3, lines 30-52.

However, Horowitz et al discloses:

wherein calculating a gain in lifetime value based on a change in the hazard function resulting from a retention effort, (Col. 22, lines 6-18, shows the calculation of a "life stage" factor through comparison of the risk level of the advice to the risk tolerances to the previous customers' activity, where the advice given represents the retention effort). Horowitz et al discloses this limitation in an analogous art for the purpose of showing that the risk factor information for the customer's "life stage" could

be updated in the customer profile, thereby maintaining a record of the customer's risk to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate a gain in lifetime value based on a change in the hazard function resulting from a retention effort with the motivation of determining `the customers likelihood of switching during the time the customer is committed to the business.

Neither Flockhart et al nor Horowitz et al disclose calculating expected revenue multiplied by an increase in remaining lifetime resulting from the retention effort, but Flockhart et al does disclose a retention effort by identifying "at risk" customers and then implementing special treatment as disclosed in col. 3, lines 30-52.

However, calculating a gain in lifetime value based on a change in the hazard function resulting from a retention effort comprises calculating expected revenue multiplied by an increase in remaining lifetime resulting from the retention effort is obvious with Bank Marketing. Bank Marketing does not specifically state that the expected revenue is multiplied by an increase in the remaining lifetime, but this article leads to the same result. Bank Marketing shows that customer profitability forms the foundation for marketing to design and effectively supply new service and product offerings, therefore, once these offerings are made, and the customer becomes active, then the lifetime value is determined to increase because of the retention offerings. Bank Marketing describes implementing activity based costing into the equation for determining the customer value on page 3, paragraphs 9-12. On page 3, paragraph 17-

Page 4, paragraph 4, Bank Marketing discloses the identification of patterns as activity based costing is altered, which ultimately helps determine profitable segments for the customer base, and eventually the lifetime value for that customer, and therefore means that revenue alters as well since its shown that the amount of profit customers bring in by segment by being involve in activity, is determined to assess potential profitability. In this case, utilizing the profitable segments in the equation for calculating the lifetime value represents the gain in lifetime value, where on Page 5, paragraph 11-Page 6, Paragraph 2, the article shows retention efforts such as offering lower price, etc. can be implemented by knowing the lifetime value. Bank Marketing discloses this limitation in an analogous art for the purpose of showing that certain equations can be used to calculate a gain in lifetime value.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate a gain in lifetime value based on a change in the hazard function resulting from a retention effort by calculating expected revenue multiplied by an increase in remaining lifetime resulting from the retention effort with the motivation of ultimately determining the gain in lifetime value.

5. Claims 61, 62, 70, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flockhart et al (US 6,064,731), and further in view of Horowitz et al (US 6,349,290), and further in view of Sanders (US 6,411,936).

As per claim 61, Flockhart et al discloses:

Generating...a hazard function for an existing customer, to determine probability of churn based on account data associated with customer and corresponding to a set

attributes, (Col. 3, lines 32-38, comparing the customer account number to the "at risk" database to determine if the customer is an "at risk" customer, also col. 1, lines 12-32 shows that the determination of an "at risk" customer is for existing customers);

determining a focus for a retention-based program based on at least one of the hazard function and the gain in lifetime value/means for determining, (col. 3, lines 38-52, shows that if there is an "at risk" customer, special treatment is implemented, also, col. 1, lines 24-28 shows that business generally implements customer service focus on agent training in an attempt to maintain high standards of service).

Flockhart et al does not specifically disclose calculating a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort, but does disclose the identification of "at risk" customers in col. 3,lines 32-38.

However, Horowitz et al discloses calculating a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort, (Col. 22, lines 6-18, shows the calculation of a "life stage" factor through comparison of the risk level of the advice to the risk tolerances to the previous customers' activity). Horowitz et al discloses this limitation in an analogous art for the purpose of showing that the risk factor information for the customer's "life stage" could be updated in the customer profile, thereby maintaining a record of the customer's risk to the business.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to calculate a gain in lifetime value for the customer based on a change in the hazard function resulting from a retention effort with the motivation of

determining `the customers likelihood of switching during the time the customer is committed to the business.

Both Flockhart et al nor Horowitz disclose a multilayer feed-forward neural network, but Flockhart et al does disclose a telephone network in Fig. 1.

However, Sanders discloses:

a multilayer feed-forward neural network, (Col. 19, lines 33-36, this neural network includes multiyear feed-forward types). Sanders discloses this limitation in an analogous art for the purpose of showing that neural networks can be used to perform necessary processing.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to incorporate a multiyear feed-forward neural network with the motivation of utilizing this type of intelligence to determine the possibility of churn.

As per claim 62, Flockhart et al discloses:

Implementing the program based on the determined focus, (col. 3, lines 38-52, shows that if there is an "at risk" customer, special treatment is implemented, also, col. 1, lines 24-28 shows that business generally implements customer service focus on agent training in an attempt to maintain high standards of service).

As per claim 70, Flockhart et al discloses:

generate a hazard function model based on the account data associated with a plurality of current customer accounts and corresponding to the set of attributes, (col. 3, lines 5-11, "at risk" customer function invoked by account number, where the "at risk"

customer function represents the hazard function model and the customer account number represents the attribute); and

Wherein generating a hazard function includes generating a hazard function for an existing customer, to determine probability of churn, based on the hazard function model and the account data associated with the customer and corresponding to a set of attributes, (Col. 3, lines 32-38, comparing the customer account number to the "at risk" database to determine if the customer is an "at risk" customer, also col. 1, lines 12-32 shows that the determination of an "at risk" customer is for existing customers);

Both Flockhart et al and Horowitz fail to disclose training the neural network, but does disclose using the telephone network to determine "at risk" customers in Col. 3, lines 5-8.

However, Sanders discloses:

Training the neural network, (col. 17, line 62-col. 18, line 33, shows the process of determining the direction of movement and the accuracy of projections of values to come up with a value enhancement solution, w/ col. 19, lines 34-37, shows that the process is carried out by neural network, thus this network must be trained in order to carry out the process). Sanders discloses this limitation in an analogous art for the purpose of showing that neural networks can be used to perform necessary processing.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to incorporate a neural network with the motivation of utilizing this type of intelligence to determine the possibility of churn.

As per claim 71, both Flockhart et al and Horowitz fail to disclose wherein training the neural network comprises loading an input layer of the neural network with values representing the set of attributes for the plurality of current customer accounts, but Flockhart et al does disclose using the telephone network to determine "at risk" customers in Col. 3, lines 5-8.

However, Sanders discloses:

wherein training the neural network comprises loading an input layer of the neural network with values representing the set of attributes for the plurality of current customer accounts, (col. 20, lines 12-20, shows the acceptance of input pertaining to an account and to provide a set of solutions customized for *at least one* of a specific target customer account). Sanders discloses this limitation in an analogous art for the purpose of enhancing overall enterprise value.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to load an input layer of the neural network with values representing the set of attributes for the plurality of current customer accounts with the motivation of applying account specific information in order to enhance the enterprise value.

Allowable Subject Matter

6. Claims 5, 7, 9, 11, 14, 15, 20, 22, 24, 26, 29, 30, 35, 37, 39, 41, 44, 45, 50, 52, 54, 56, 59, 60, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to claims 1-71 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akiba K Robinson-Boyce whose telephone number is 571-272-6734. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Hayes can be reached on 571-272-6708. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7238 [After final communications, labeled "Box AF"], 703-746-7239 [Official Communications], and 703-746-7150 [Informal/Draft Communications, labeled "PROPOSED" or "DRAFT"].

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

A. R. B.
May 17, 2006

JOHN W. HAYES
SUPERVISORY PATENT EXAMINER